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**IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF NEW JERSEY**

PARKER-HANNIFIN CORPORATION and  
SRI INTERNATIONAL,

Plaintiffs,

v.

OPTOTUNE SWITZERLAND AG and  
EDMUND OPTICS INC.,

Defendants.

Civil Action No. \_\_\_\_\_

**COMPLAINT FOR PATENT  
INFRINGEMENT**

**JURY TRIAL DEMANDED**

Document Electronically Filed

Plaintiffs Parker-Hannifin Corporation (“Parker-Hannifin”) and SRI International (“SRI”), by and through their undersigned counsel, file this Complaint against Defendants Optotune Switzerland AG (“Optotune”) and Edmund Optics Inc. (“Edmund”), and allege on knowledge as to their actions, and upon knowledge and information and belief as to the actions of others, as follows:

### **NATURE OF THE ACTION**

1. This action is brought under the patent laws of the United States, 35 U.S.C. §§ 1, *et seq.*, for Defendants' infringement of the following United States patents:

- United State Patent No. 7,199,501 ("the '501 Patent");
- United State Patent No. 6,940,211 ("the '211 Patent");
- United State Patent No. 6,545,384 ("the '384 Patent");
- United State Patent No. 6,664,718 ("the '718 Patent");
- United State Patent No. 7,224,106 ("the '106 Patent");
- United State Patent No. 6,543,110 ("the '110 Patent"); and
- United State Patent No. 7,923,064 ("the '064 Patent") (collectively, the "Asserted Patents").

2. The Asserted Patents all relate to electroactive polymers, or "EAPs," which are polymers that exhibit a change in shape or size when electrically stimulated. They are commonly used in actuators, transducers and sensors and are sometimes called "artificial muscles."

3. An "actuator" is a device that opens, closes or otherwise moves another device or mechanism, such as a valve, in response to a control signal.

4. A "transducer" is a device that converts one form of energy such as electrical into another form of energy such as mechanical.

5. A "sensor" is a device that detects or measures changes in a physical property such as temperature or pressure.

6. Prior to the inventions claimed in the Asserted Patents, EAPs received relatively little attention due to their limited actuation capability. Research at Plaintiff SRI, however,

spawned new, more commercially-viable EAP materials that exhibit significantly greater responses to electrical stimulation. The breakthroughs in that research led to the inventions described and claimed in the Asserted Patents.

7. Plaintiff Parker-Hannifin is a Fortune 250 company recognized as a global leader in motion and control technologies. For 100 years the company has engineered the success of its customers in a wide range of diversified industrial and aerospace markets.

8. Building on the research begun by Plaintiff SRI, Plaintiff Parker-Hannifin has developed EAP technology that can be used in a variety of applications including sensors and actuators. Plaintiff Parker-Hannifin also markets evaluation kits that allow scientists and engineers to learn about EAP products and their unique capabilities.

9. Plaintiff Parker-Hannifin is now the exclusive, worldwide licensee of the Asserted Patents for a multitude of EAP products and applications.

10. Plaintiff Parker-Hannifin has sublicensed its rights to others under the Asserted Patents to develop markets and increase commercial demand for EAP products and applications.

11. Defendant Optotune employs EAP technology in its Laser Speckle Reducer (LSR) products. LSRs are optical components used in laser systems such as projection displays, head-up displays, and beam homogenizers. For example, microscopically rough optical surfaces such as a wall or cinema screen can cause local interferences which may appear as a grainy pattern of spots or “speckles.” LSRs are used to reduce such speckles.

12. Defendant Optotune has known of the Asserted Patents since at least 2012, and also has known that its use of EAP technology in its LSR products requires a commercial license under the Asserted Patents. Defendant Optotune nonetheless has ignored Plaintiff Parker-

Hannifin's repeated offers to grant such a license and has chosen instead to disregard Plaintiffs' rights by willfully infringing the Asserted Patents.

13. Plaintiffs, therefore, seek injunctive relief against further infringement and damages for past infringement.

### **THE PARTIES**

14. Plaintiff SRI is an independent, not-for-profit research institute incorporated under the laws of California, and has a regular and established place of business at 333 Ravenswood Avenue, Menlo Park, California, 94025.

15. Plaintiff Parker-Hannifin is a corporation organized and existing under the laws of the State of Ohio and having its principal place of business at 6035 Parkland Boulevard, Cleveland, Ohio 44124.

16. Defendant Optotune is a Swiss corporation having a place of business at Bernstrasse 388, CH-8953 Dietikon, Switzerland.

17. Defendant Edmund is a corporation organized and existing under the laws of the State of New Jersey, having a place of business at 101 East Gloucester Pike, Barrington, New Jersey 08007.

### **JURISDICTION AND VENUE**

18. This is an action for patent infringement arising under the patent laws of the United States, 35 U.S.C. § 271 *et seq.*

19. This Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331, 1332 and 1338(a).

20. This Court has personal jurisdiction over Defendant Optotune because Optotune, acting in concert with its distributor Edmund who is based in New Jersey, has purposefully

directed its activities at residents of the forum, and the litigation results from alleged injuries that arise out of or relate to those activities.

21. The Court has personal jurisdiction over Defendant Edmund because Edmund is a New Jersey corporation which is headquartered in Barrington, New Jersey.

22. Defendants have committed acts of direct infringement and/or induced acts of infringement by others in the State of New Jersey and this judicial District.

23. As a result, Defendants have intentionally availed themselves of the privilege of conducting business in this State and District, have purposefully directed activity at this State and District, and have established sufficient minimum contacts with this State and District such that Defendants can reasonably and fairly anticipate being haled into this Court.

24. Venue is proper in this district pursuant to 28 U.S.C. §§ 1400(b) and 1391(b)-(c) because Edmund is incorporated in this State and District, and because Optotune, as a foreign corporation, can be sued in any judicial district.

#### **THE ASSERTED PATENTS**

25. On April 3, 2007, the United States Patent and Trademark Office (“USPTO”) duly and lawfully issued the ‘501 Patent, entitled “Electroactive Polymers.” The ‘501 Patent describes and claims EAP transducers for converting electrical energy to mechanical energy. A true and correct copy of the ‘501 Patent is provided as Ex. A.

26. On September 6, 2005, the USPTO duly and lawfully issued the ‘211 Patent, entitled “Electroactive Polymers, Transducers and Actuators.” The ‘211 Patent describes and claims an actuator that includes an EAP transducer. A true and correct copy of the ‘211 Patent is provided as Ex. B.

27. On April 8, 2003, the USPTO duly and lawfully issued the ‘384 Patent, entitled “Electroactive Polymer Devices.” The ‘384 Patent describes and claims a device that includes an EAP transducer. A true and correct copy of the ‘384 Patent is provided as Ex. C.

28. On December 16, 2003, the USPTO duly and lawfully issued the ‘718 Patent, entitled “Monolithic Electroactive Polymers.” The ‘718 Patent describes and claims an EAP transducer. A true and correct copy of the ‘718 Patent is provided as Ex. D.

29. On May 29, 2007, the USPTO duly and lawfully issued the ‘106 Patent, entitled “Electroactive Polymers.” The ‘106 Patent describes and claims an EAP transducer. A true and correct copy of the ‘106 Patent is provided as Ex. E.

30. On April 8, 2003, the USPTO duly and lawfully issued the ‘110 Patent, entitled “Electroactive Polymer Fabrication.” The ‘110 Patent describes and claims a method of fabricating a transducer using a pre-strained polymer. A true and correct copy of the ‘110 Patent is provided as Ex. F.

31. On April 12, 2011, the USPTO duly and lawfully issued the ‘064 Patent, entitled “Electroactive Polymer Manufacturing.” The ‘064 Patent describes and claims a method of fabricating a device that includes an EAP and multiple electrodes. A true and correct copy of the ‘064 Patent is provided as Ex. G.

32. Plaintiff SRI is the owner and assignee of the Asserted Patents.

33. On or around November 25, 2003, SRI entered into a license agreement (“License Agreement”) with Plaintiff Parker-Hannifin’s predecessor in interest Artificial Muscle, Inc. (“AMI”). SRI granted AMI an exclusive, worldwide license to the Asserted Patents in in all fields other than permanently implantable medical devices and submillimeter devices. Such grant also included the right to sue for past, present and future infringement.

34. Effective on or around March 31, 2010, Bayer MaterialScience AG (“BMS”) acquired certain assets of AMI, including AMI’s rights under the License Agreement.

35. Effective on or around May 28, 2014, Parker-Hannifin acquired certain assets from BMS, including BMS’ rights under the License Agreement.

36. The License Agreement requires Parker-Hannifin, as licensee, to mark products made under the Asserted Patents and Parker-Hannifin’s sub-licensees are required to mark their products made under the Asserted Patents.

### **ACCUSED PRODUCTS**

37. Defendant Optotune sells and offers for sale within the United States, and imports into the United States, a variety of EAP laser speckle reducer (LSR) models, including but not limited to the following series: LSR-3000, LSR-3005, LSR-3010, LSR-5-17 and LSR-10-22. All of these LSR series models include EAP transducers.

38. “Accused Products” as used herein means Optotune’s EAP LSRs, including but not limited to the LSR-3000, LSR-3005, LSR-3010, LSR-5-17 and the LSR-10-22 series models.

39. Ex. I is a true and correct paper by three Optotune employees, entitled “Reducing laser speckle with electroactive polymer actuators.” This paper was published in the Proceedings of SPIE in 2015 and as of the date of this Complaint is available on the Optotune website at [www.optotune.com/images/papers/150301%20Reducing%20laser%20speckle%20with%20electroactive%20polymer%20actuators.pdf](http://www.optotune.com/images/papers/150301%20Reducing%20laser%20speckle%20with%20electroactive%20polymer%20actuators.pdf).

40. Ex. I states that “Optotune has developed a laser speckle reducer by combining the efficient speckle reduction method moving diffuser.”

41. Ex. I describes the “principle of operation of the EAP-based speckle reducer” as follows: “A circular diffuser is suspended to a transparent membrane. The membrane is coated with four conductive areas surrounding the diffuser and a ground electrode on the backside. The

actuators are activated in a round-robin fashion, generating a circular motion of the diffuser in the center of the membrane. By driving the actuators at the natural mechanical resonant frequency of the system, the amplitude of motion of the diffuser can be maximized, which in turn maximizes the speckle reduction.”

42. Upon information and belief, the Accused Products operate according to the principle of operation described in Ex. I as follows:

- (a) the Accused Products have a ground electrode on the backside of an EAP membrane;
- (b) The front side of the EAP membrane includes the diffuser and four electrodes; and
- (c) When a voltage is applied to one of the front electrodes, the voltage difference between the energized front electrode and back, ground electrode causes the EAP membrane to deform, thereby causing the diffuser to move.

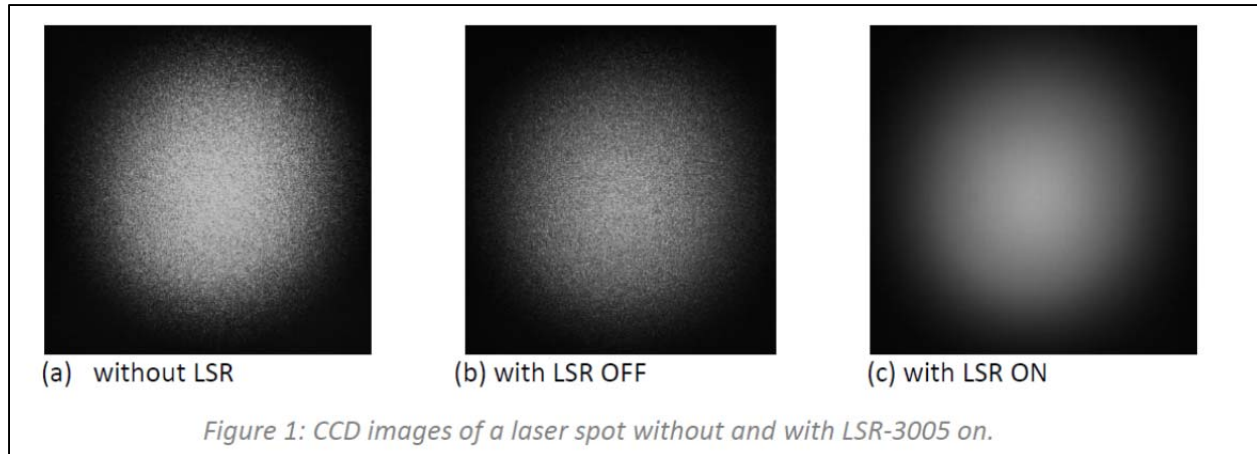
43. Appropriate motion of the diffuser reduces speckle of laser light that passes through the LSR and onto a target.

44. The electrodes and the EAP membrane collectively form a transducer that converts electrical energy to mechanical energy.

45. Ex. J is a true and correct datasheet for an Optotune LSR-3000 Series model. As of the date of this Complaint, Ex. J is available on the Optotune website at [www.optotune.com/images/products/Optotune%20LSR-3000%20Series.pdf](http://www.optotune.com/images/products/Optotune%20LSR-3000%20Series.pdf).

46. Figure 1(a-c) of Ex. J are three images, with the image at Figure 1(c) showing the reduced speckle of a laser spot with the Optotune LSR-3005 model.

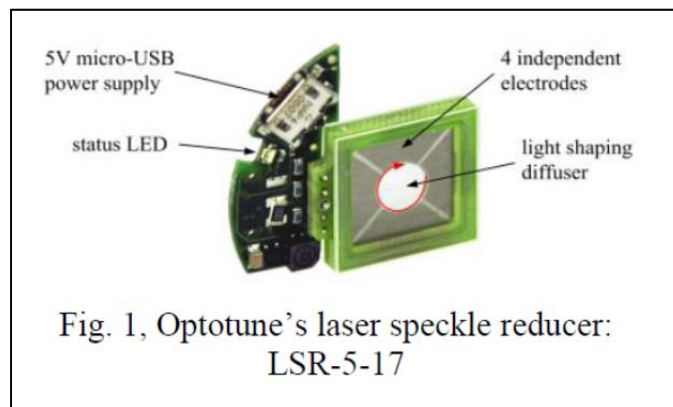




47. Ex. J accurately describes the operation of Optotune's LSR-3000 Series model.

48. Ex. K is a true and correct copy of another paper by Optotune employees entitled "Laser Speckle Reduction based on electroactive polymers." Ex. K was published in 2012 and as of the date of this Complaint is available on the Optotune website at [www.optotune.com/images/papers/120426%20Laser%20Speckle%20Reduction%20based%20on%20electroactive%20polymers.pdf](http://www.optotune.com/images/papers/120426%20Laser%20Speckle%20Reduction%20based%20on%20electroactive%20polymers.pdf).

49. Figure 1 of Ex. K (reproduced below) shows an Optotune LSR-5-17 model.

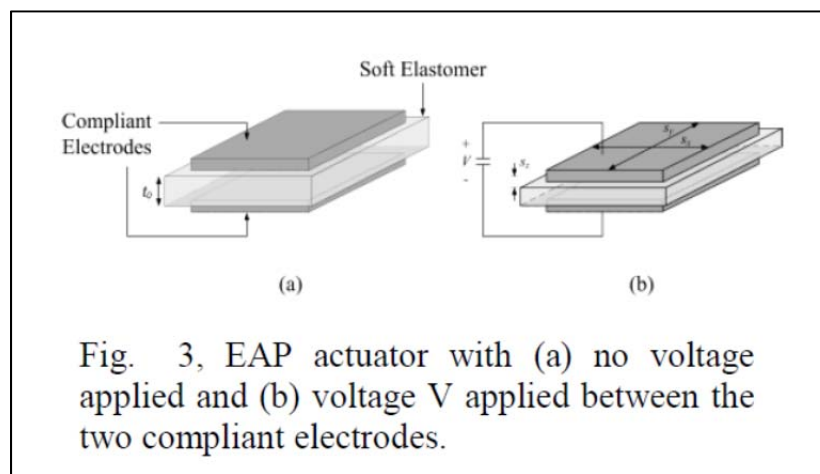


50. Ex. K states that the "secret behind the solution is actuators made of electroactive polymers . . . ."

51. Upon information and belief, the Accused Products use actuators made of electroactive polymers.

52. Ex. K describes the Accused Products in part as follows: “[f]lexible conductive surfaces are attached to the top and bottom of a thin elastomer film. When a voltage is applied between the two electrodes, these are charged according to the principle of a plate capacitor, attract one another and thus squeeze the elastic film.... Given that the volume remains constant, the electrodes expand laterally, theoretically by up to 40 percent, and thus move the diffuser.”

53. Fig. 3 of Ex. K, reprinted below, shows that when a voltage is applied across an EAP, the EAP deforms.



54. The two electrodes and the EAP shown in Fig. 3 of Ex. K together form a transducer that converts electrical energy to mechanical energy.

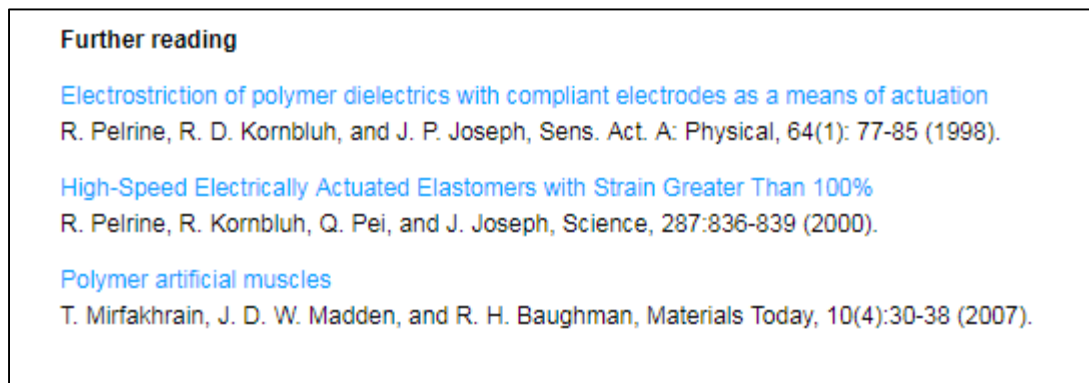
55. Upon information and belief, Fig. 3 of Ex. K accurately illustrates the principle of operation of the EAPs in the Accused Products.

56. Ex. L is a true and correct printout of a webpage available on the Optotune website at [www.optotune.com/technology/electroactive-polymers](http://www.optotune.com/technology/electroactive-polymers).

57. Ex. L states as to the EAPs in Optotune’s LSR models that Optotune has “optimized materials and processes to reach about 15% deformation at 300V.”

58. Upon information and belief, Ex. L accurately describes the operation of the Accused Products in that the EAPs in the Accused Products deform “about 15%” when a voltage is applied across the electrodes on opposite sides of the EAP.

59. Ex. L includes a “Further Reading” section listing three papers as shown below.



60. The first-named author for the first two listed papers is Ron Pelrine, an inventor on each of the Asserted Patents.

61. The second listed paper, “High-Speed Electrically Actuated Elastomers with Stain Greater Than 100%,” describes pre-straining the EAPs to improve the performance of the EAPs.

62. Ex. J states that the EAP in Optotune’s LSRs have a thickness of 300 micrometers (μm).

63. Upon information and belief, Optotune pre-stretches the EAP in the Accused Products in order to meet this polymer-thickness level.

64. Upon information and belief, the EAP in Optotune’s LSR models is pre-strained by a factor of between 1 and 50, and has an elastic modulus less than 100 MPa.

65. Further evidence that Optotune pre-stretches the EAP in its LSR models is found in Optotune’s own U.S. Patent 8,902,520 (“the ‘520 Patent”). The CEO of Optotune, Mr. Aschwanden, is listed as an inventor on the ‘520 Patent. A true and correct copy of the ‘520 Patent is provided as Exhibit M.

66. The '520 Patent is entitled "Electroactive Optical Device."

67. The "Electroactive Optical Device" described in the '520 Patent includes a "polymer film" sandwiched between a pair of electrodes.

68. The '520 Patent states that the pre-strained polymer is attached to a rectangular holding frame. '520 Patent at Col. 7:1-3.

69. The process for making "Electroactive Optical Device" described in the '520 Patent includes "stretching [the] polymer film by a certain amount, e.g., 200% in x-direction and 300% in y-direction." '520 Patent at col. 3:21-25.

70. Pre-stretching the EAP improves the mechanical response of the transducer when EAP deflects from an undeflected first position to a deflected second position.

71. Upon information and belief, the Accused Products practice the systems and methods described in the '520 Patent.

72. At least one reason that Optotune pre-stretches the EAP in its LSR products, including the LSR-3000 model, is to improve their mechanical response.

73. Figure 1 of Ex. K (reprinted above at ¶ 49) shows that:

(a) Optotune's LSR products include a four-sided support structure or frame (shown in green in the image above) around the EAP.

(b) The frame is attached to the EAP.

74. Upon information and belief, the EAP in Optotune's LSR products is pre-stretched and is prevented from returning to its unstretched position by the frame.

75. Defendant Optotune lists Defendant Edmund as a sales partner on its website. See [www.optotune.com/contacts/sales-partners](http://www.optotune.com/contacts/sales-partners).

76. Upon information and belief, Edmund is Optotune's preferred sales partner in the United States and sells and offers to sell the Accused Products in the United States.

**OPTOTUNE'S KNOWLEDGE OF THE PATENTS**

77. On May 12, 2016, Mr. William E. Kuss, of K&L Gates, wrote a letter of behalf of Parker-Hannifin Corporation to Dr. Manuel Aschwanden, CEO of Optotune ("the May 12, 2016 Letter"). A true and correct copy of the May 12, 2016 Letter, including its exhibits, is provided as Exhibit N hereto.

78. The May 12, 2016 letter advises that "Parker has acquired the BMS/AMI global patent portfolio which includes certain rights under the seminal SRI patents."

79. The May 12, 2016 letter recounts that Optotune has "had discussions with BMS regarding potential licensing and other opportunities under this portfolio."

80. The first exhibit to the May 12, 2016 letter included the copies of the seven Asserted Patents in this complaint.

81. Optotune has been aware of the seven Asserted Patents in this complaint since at least the date that it received the May 12, 2016 letter.

82. On August 9, 2016, Sarit Ventura, Head of Legal for Optotune, responded by email to the May 12, 2016 letter. A true and correct copy of Ms. Ventura's response is provided as Exhibit O.

83. Ms. Ventura's response email did not deny infringement, stating instead that "Optotune has no intention to license any intellectual property rights of the attached SRI patents nor could any document or active memory be found internally which supports the statement that Optotune was interested in licensing such rights from BMS."

84. Optotune has ignored follow-up communications from Plaintiffs.

85. Prior to August 9, 2016, Optotune in fact did have discussions with BMS about licensing EAP technology from BMS.

86. In particular, in November and December 2012, Mr. Aschwanden, CEO of Optotune, exchanged emails with Mr. Wilfried Hedderich, IP Manager of BMS, in which the parties discussed the possibility of Optotune licensing BMS' EAP technology for certain Optotune products, specifically Optotune's LSR products.

87. On September 29, 2016, Mr. Kuss responded to Ms. Ventura's August 9, 2016 email ("the September 29, 2016 Letter"). A copy of the September 29, 2016 Letter is provided as Exhibit P.

88. The September 29, 2016 Letter states that "representatives of Parker have noticed from a review of your website and of actual samples obtained in the United States, that, for example, your 'LSR-3000' product ... bears strong similarities to the subject matter of the claims of certain patents in [Parker-Hannifin's] EAP patent portfolio and can be formed or used in a similar manner."

89. The September 29, 2016 Letter stated that Parker-Hannifin "would be grateful for your comments about your EAP products as they relate to the claims of these US patents by November 1, 2016."

90. Optotune has never responded to the September 29, 2016 Letter.

**COUNT ONE - INFRINGEMENT OF THE '501 PATENT**

91. Paragraphs 1 to 90 are incorporated herein by reference as if fully set forth herein.

92. As a representative claim of the '501 Patent, claim 5 recites a transducer for converting between mechanical and electrical energy.

93. The elements of the transducer of claim 5 are:

(a) at least two electrodes; and

- (b) a polymer arranged in a manner which causes a portion of the polymer to deflect in response to a change in electric field and/or arranged in a manner which causes a change in electric field in response to deflection of the polymer, wherein the polymer is elastically pre-strained by a factor in the range of about  $-1$  times to about 50 times an original area of the polymer, wherein the polymer has an elastic modulus at most about 100 MPa.

94. The Accused Products, including the LSR-3000 model, include at least two electrodes and an EAP positioned between the electrodes.

95. An electric field is generated between the electrodes when a voltage is applied across the electrodes.

96. A change in the voltage across the electrodes causes a change in the electric field between the electrodes.

97. When the EAP in the Accused Products, including the LSR-3000 model, experiences “about 15% deformation” due to a voltage applied across the two electrodes (see Ex. L), a portion of the EAP deflects in response to a change in electric field.

98. The EAP in the Accused Products, including the LSR-3000 model, is elastically pre-strained by a factor in the range of  $-1$  to 50 times.

99. The EAP in the Accused Products, including the LSR-3000 model, has an elastic modulus less than 100 MPa.

100. Defendants have directly infringed and continue to directly infringe at least claim 5 of the '501 Patent by using, offering for sale, selling and/or importing the Accused Products, including the LSR-3000 model, without authority in or into the United States, and will continue

to do so unless enjoined by this Court or the patent expires, whichever is sooner. As a direct and proximate result of Defendants' direct infringement of the '501 Patent, Plaintiffs Parker-Hannifin and SRI have been and continue to be damaged.

101. Defendant Optotune has been aware of the '501 Patent since at least when it received the May 12, 2016 letter (Ex. N).

102. Defendant Optotune at least has indirectly infringed and continues to indirectly infringe at least claim 5 of the '501 Patent by actively inducing its respective customers of the Accused Products to directly infringe at least claim 5 of the '501 Patent by, among other things, providing Accused Products to users thereof with instructions on how to use the Accused Products. Defendant Optotune engaged and hence forward will continue to engage in such inducement having knowledge of the '501 Patent. Furthermore, Defendant Optotune knew or should have known that its actions would and will continue to induce direct infringement by the users of the Accused Products, and intended and will continue to intend that its actions would induce direct infringement by such users. As a direct and proximate result of Defendant Optotune's indirect infringement by inducement of the '501 Patent, Plaintiffs Parker-Hannifin and SRI have been and continue to be damaged.

103. By engaging in the conduct described herein, Defendants has injured Plaintiffs Parker-Hannifin and SRI and are liable for infringement of the '501 Patent, pursuant to 35 U.S.C. § 271.

104. Defendants have committed these acts of infringement without license or authorization.



105. Defendant Optotune has committed these acts of infringement with knowledge of the '501 Patent and thus has acted recklessly and willfully with regard to the rights of Plaintiffs Parker-Hannifin and SRI in the '501 Patent.

106. As a result of Defendants' infringement of the '501 Patent, which is willful at least in the case of Optotune, Plaintiffs Parker-Hannifin and SRI have suffered monetary damages and are entitled to a monetary judgment in an amount at least adequate to compensate for Defendants' infringement.

107. Plaintiffs Parker-Hannifin and SRI will continue to suffer damages in the future unless Defendants' infringing activities are enjoined by this Court or the patent expires, whichever is sooner. As such, Plaintiffs Parker-Hannifin and SRI are entitled to compensation for any continuing and/or future infringement of the '501 Patent until the date that Defendants are finally and permanently enjoined from further infringement or the patent expires, whichever is sooner.

**COUNT TWO - INFRINGEMENT OF THE '211 PATENT**

108. Paragraphs 1 to 107 are incorporated herein by reference as if fully set forth herein.

109. As a representative claim of the '211 Patent, claim 41 recites a transducer for converting from electrical energy to mechanical energy.

110. The elements of the transducer of claim 41 are:

- (a) at least two electrodes;
- (b) a polymer arranged in a manner which causes a portion of the polymer to deflect from a first position with a first surface area to a second position with a second surface area in response to a change in electric field, wherein the polymer has an elastic modulus below about 100 MPa;

- (c) a support structure for securing the portion of the polymer at the first position wherein the portion of the polymer is stretched from an initial surface area to the first surface area to improve the mechanical response of the transducer when it deflects from the first position to the second position and wherein the support structure is for supplying a force to the stretched portion of the polymer that prevents the stretched portion of the polymer from returning from the first surface area to about its initial surface area and wherein a ratio of the first surface area to the initial surface area is in the range of about 1.5 to 50.

111. In experiencing “about 15% deformation” due to a voltage applied across the electrodes (see Ex. L), a portion of the EAP in the Accused Products deflects from a first position with a first surface area to a second position with a second surface area.

112. The EAP in the Accused Products, including the LSR-3000 model, is stretched from an initial unstretched surface area to a first stretched surface area.

113. The ratio of the first stretched surface area to the initial unstretched surface area is between 1.5 and 50.

114. The Accused Products include a support structure around and secured to the EAP, where the support structure prevents the stretched EAP from returning from its stretched state of the first surface area to the unstretched state of the initial surface area.

115. Defendants have directly infringed and continue to directly infringe at least claim 41 of the '211 Patent by using, offering for sale, selling and/or importing the Accused Products, including the LSR-3000 model, without authority in or into the United States, and will continue to do so unless enjoined by this Court or the patent expires, whichever is sooner. As a direct and

proximate result of Defendants' direct infringement of the '211 Patent, Plaintiffs Parker-Hannifin and SRI have been and continue to be damaged.

116. Defendant Optotune has been aware of the '211 Patent since at least when it received the May 12, 2016 letter (Ex. N).

117. Defendant Optotune at least has indirectly infringed and continues to indirectly infringe at least claim 41 of the '211 Patent by actively inducing its respective customers of the Accused Products to directly infringe at least claim 41 of the '211 Patent by, among other things, providing Accused Products to users thereof with instructions on how to use the Accused Products. Defendant Optotune engaged and hence forward will continue to engage in such inducement having knowledge of the '211 Patent. Furthermore, Defendant Optotune knew or should have known that its actions would and will continue to induce direct infringement by the users of the Accused Products, and intended and will continue to intend that its actions would induce direct infringement by such users. As a direct and proximate result of Defendant Optotune's indirect infringement by inducement of the '211 Patent, Plaintiffs Parker-Hannifin and SRI have been and continue to be damaged.

118. By engaging in the conduct described herein, Defendants has injured Plaintiffs Parker-Hannifin and SRI and are liable for infringement of the '211 Patent, pursuant to 35 U.S.C. § 271.

119. Defendants have committed these acts of infringement without license or authorization.

120. Defendant Optotune has committed these acts of infringement with knowledge of the '211 Patent and thus has acted recklessly and willfully with regard to the rights of Plaintiffs Parker-Hannifin and SRI in the '211 Patent.

121. As a result of Defendants infringement of the '211 Patent, which is willful at least in the case of Optotune, Plaintiffs Parker-Hannifin and SRI have suffered monetary damages and are entitled to a monetary judgment in an amount at least adequate to compensate for Defendants' infringement.

122. Plaintiffs Parker-Hannifin and SRI will continue to suffer damages in the future unless Defendants' infringing activities are enjoined by this Court or the patent expires, whichever is sooner. As such, Plaintiffs Parker-Hannifin and SRI are entitled to compensation for any continuing and/or future infringement of the '211 Patent until the date that Defendants are finally and permanently enjoined from further infringement or the patent expires, whichever is sooner.

**COUNT THREE- INFRINGEMENT OF THE '384 PATENT**

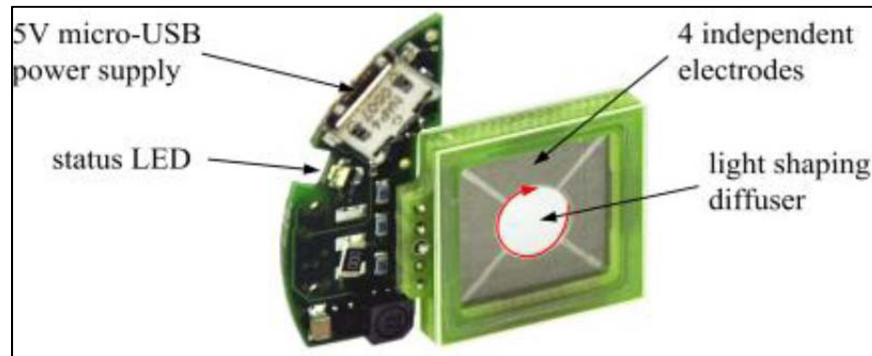
123. Paragraphs 1 to 122 are incorporated herein by reference as if fully set forth herein.

124. As a representative claim of the '384 Patent, claim 16 recites a device for converting between electrical energy and mechanical energy.

125. The elements of the device of claim 16 are:

- (a) at least one transducer, each transducer comprising: at least two electrodes, and a polymer arranged in a manner which causes a portion of the polymer to deflect in response to a change in electric field and/or arranged in a manner which causes a change in electric field in response to deflection of the polymer, wherein the polymer has an elastic modulus at most about 100 MPa without electrical energy applied thereto; and
- (b) a frame attached to a second portion of the polymer, the frame comprising at least one non-circular aperture.

126. The Accused Products, including the LSR-3000 model, have a transducer and a frame as shown in Figure 1 of Ex. K reproduced below. The frame is the green square surrounding the grey-colored transducer.



127. The transducer in the image depicted above includes two electrodes, and an EAP disposed between the electrodes, with the EAP experiencing “about 15% deformation” when a voltage is applied across the electrodes.

128. The frame has a non-circular, rectangular opening.

129. Defendants have directly infringed and continue to directly infringe at least claim 16 of the '384 Patent by using, offering for sale, selling and/or importing the Accused Products, including the LSR-3000 model, without authority in or into the United States, and will continue to do so unless enjoined by this Court or the patent expires, whichever is sooner. As a direct and proximate result of Defendants' direct infringement of the '384 Patent, Plaintiffs Parker-Hannifin and SRI have been and continue to be damaged.

130. Defendant Optotune has been aware of the '384 Patent since at least when it received the May 12, 2016 letter (Ex. N).

131. Defendant Optotune at least has indirectly infringed and continues to indirectly infringe at least claim 16 of the '384 Patent by actively inducing its respective customers of the Accused Products to directly infringe at least claim 16 of the '384 Patent by, among other things,

providing Accused Products to users thereof with instructions on how to use the Accused Products. Defendant Optotune engaged and hence forward will continue to engage in such inducement having knowledge of the '384 Patent. Furthermore, Defendant Optotune knew or should have known that its actions would and will continue to induce direct infringement by the users of the Accused Products, and intended and will continue to intend that its actions would induce direct infringement by such users. As a direct and proximate result of Defendant Optotune's indirect infringement by inducement of the '384 Patent, Plaintiffs Parker-Hannifin and SRI have been and continue to be damaged.

132. By engaging in the conduct described herein, Defendants has injured Plaintiffs Parker-Hannifin and SRI and are liable for infringement of the '384 Patent, pursuant to 35 U.S.C. § 271.

133. Defendants have committed these acts of infringement without license or authorization.

134. Defendant Optotune has committed these acts of infringement with knowledge of the '384 Patent and thus has acted recklessly and willfully with regard to the rights of Plaintiffs Parker-Hannifin and SRI in the '384 Patent.

135. As a result of Defendants infringement of the '384 Patent, which is willful at least in the case of Optotune, Plaintiffs Parker-Hannifin and SRI have suffered monetary damages and are entitled to a monetary judgment in an amount at least adequate to compensate for Defendants' infringement.

136. Plaintiffs Parker-Hannifin and SRI will continue to suffer damages in the future unless Defendants' infringing activities are enjoined by this Court or the patent expires, whichever is sooner. As such, Plaintiffs Parker-Hannifin and SRI are entitled to compensation

for any continuing and/or future infringement of the '384 Patent until the date that Defendants are finally and permanently enjoined from further infringement or the patent expires, whichever is sooner.

**COUNT FOUR- INFRINGEMENT OF THE '718 PATENT**

137. Paragraphs 1 to 136 are incorporated herein by reference as if fully set forth herein.

138. As a representative claim of the '718 Patent, claim 10 recites a device for converting between electrical energy and mechanical energy.

139. The elements of the device of claim 10 are:

- (a) an electroactive polymer having a plurality of active areas, the plurality of active areas comprising:
  - (i) a first active area having at least two first active area electrodes and a first portion of the electroactive polymer arranged in a manner which causes the first portion to deflect in response to a change in electric field provided by the at least two first active area electrodes and/or arranged in a manner which causes a change in electric field in response to deflection of the first portion,
  - (ii) a second active area having at least two second active area electrodes and a second portion of the electroactive polymer arranged in a manner which causes the second portion to deflect in response to a change in electric field provided by the at least two second active area electrodes and/or arranged in a manner which causes a change in electric field in response to deflection of the second portion; and

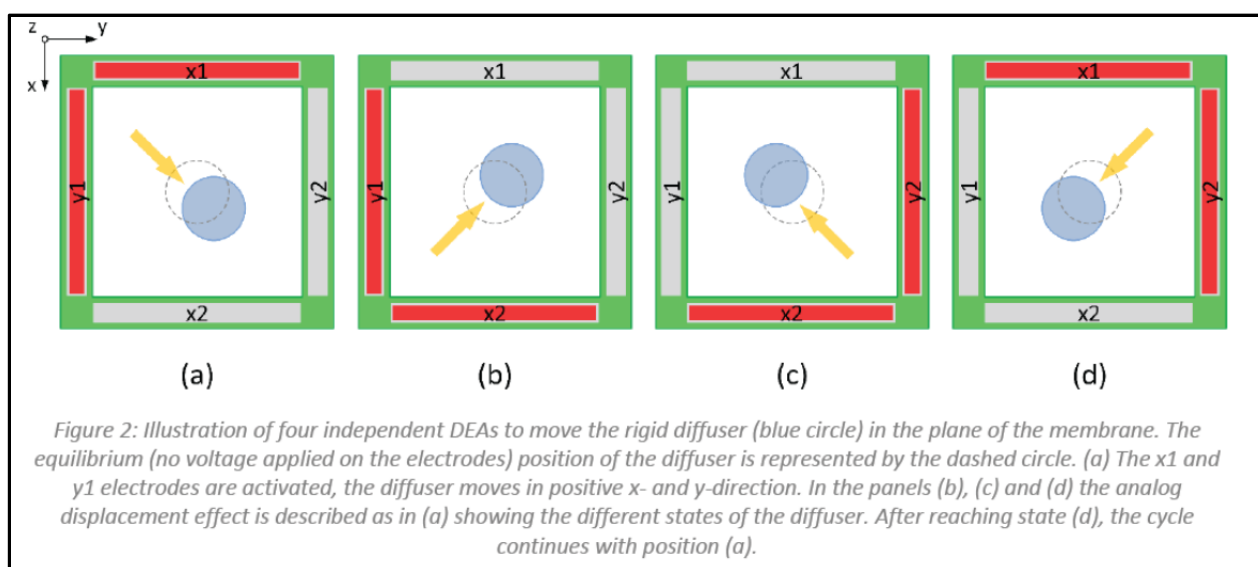
- (iii) a substantially rigid member coupled to a third portion of the electroactive polymer, wherein the electroactive polymer is elastically pre-strained by a factor in the range of about 1.5 times to 50 times the original area.

140. Ex. H is a true and correct copy of a document available on the Optotune website at [www.optotune.com/impages/products/optotune%20application%20note%20LSR.pdf](http://www.optotune.com/impages/products/optotune%20application%20note%20LSR.pdf) as of the date of this complaint, entitled “Application note: Laser speckle reduction with Optotune’s laser speckle reducer LSR-3000 & LSR-OEM.”

141. Ex. H states, at page 4, that Optotune’s LSRs consist of “a diffuser bonded on a polymer membrane that includes four independent dielectric elastomer actuators (DEAs).”

142. The Accused Products, including the LSR-3000 model, have a diffuser bonded on a polymer membrane that includes four independent dielectric elastomer actuators (DEAs).

143. Ex. H states, at page 4, that the “four independent electrodes are used to obtain displacement of the diffuser in both directions of the x- and y-axis,” as shown in Figure 2 of Ex. H reproduced below.





144. The Accused Products, including the LSR-3000 model, have four independent electrodes that displace the diffuser in both directions of the x- and y-axis.

145. As shown in part (a) of Figure 2 of Ex. H, the EAP of Optotune's laser speckle reducer LSR-3000 model includes a first active area having two first active area electrodes, electrodes x1 and y1, with a first portion of the electroactive polymer arranged so as to cause the first portion to deflect in response to a change in electric field provided by the two first active area electrodes.

146. As shown in part (b) of Figure 2 of Ex. H, the EAP of Optotune's laser speckle reducer LSR-3000 model includes a second active area having two second active area electrodes, electrodes x2 and y1, with a second portion of the electroactive polymer arranged so as to cause the second portion to deflect in response to a change in electric field provided by the two second active area electrodes.

147. As shown in Figure 2 of Ex. H, Optotune's laser speckle reducer LSR-3000 model has a substantially rigid member, shown as the green rectangle in Figure 2, that is coupled to a third portion of the EAP.

148. In Optotune's laser speckle reducer LSR-3000 model, the electroactive polymer is elastically pre-strained by a factor in the range of about 1.5 times to 50 times the original area.

149. Defendants have directly infringed and continue to directly infringe at least claim 10 of the '718 Patent by using, offering for sale, selling and/or importing the Accused Products, including the LSR-3000 model, without authority in or into the United States, and will continue to do so unless enjoined by this Court or the patent expires, whichever is sooner. As a direct and proximate result of Defendants' direct infringement of the '718 Patent, Plaintiffs Parker-Hannifin and SRI have been and continue to be damaged.

150. Defendant Optotune has been aware of the '718 Patent since at least when it received the May 12, 2016 letter (Ex. N).

151. Defendant Optotune at least has indirectly infringed and continues to indirectly infringe at least claim 10 of the '718 Patent by actively inducing its respective customers of the Accused Products to directly infringe at least claim 10 of the '718 Patent by, among other things, providing Accused Products to users thereof with instructions on how to use the Accused Products. Defendant Optotune engaged and hence forward will continue to engage in such inducement having knowledge of the '718 Patent. Furthermore, Defendant Optotune knew or should have known that its actions would and will continue to induce direct infringement by the users of the Accused Products, and intended and will continue to intend that its actions would induce direct infringement by such users. As a direct and proximate result of Defendant Optotune's indirect infringement by inducement of the '718 Patent, Plaintiffs Parker-Hannifin and SRI have been and continue to be damaged.

152. By engaging in the conduct described herein, Defendants has injured Plaintiffs Parker-Hannifin and SRI and are liable for infringement of the '718 Patent, pursuant to 35 U.S.C. § 271.

153. Defendants have committed these acts of infringement without license or authorization.

154. Defendant Optotune has committed these acts of infringement with knowledge of the '718 Patent and thus has acted recklessly and willfully with regard to the rights of Plaintiffs Parker-Hannifin and SRI in the '718 Patent.

155. As a result of Defendants infringement of the '718 Patent, which is willful at least in the case of Optotune, Plaintiffs Parker-Hannifin and SRI have suffered monetary damages and

are entitled to a monetary judgment in an amount at least adequate to compensate for Defendants' infringement.

156. Plaintiffs Parker-Hannifin and SRI will continue to suffer damages in the future unless Defendants' infringing activities are enjoined by this Court or the patent expires, whichever is sooner. As such, Plaintiffs Parker-Hannifin and SRI are entitled to compensation for any continuing and/or future infringement of the '718 Patent until the date that Defendants are finally and permanently enjoined from further infringement or the patent expires, whichever is sooner.

**COUNT FIVE - INFRINGEMENT OF THE '106 PATENT**

157. Paragraphs 1 to 156 are incorporated herein by reference as if fully set forth herein.

158. As a representative claim of the '106 Patent, claim 1 recites a transducer for converting mechanical and electrical energy.

159. The elements of the transducer of claim 1 are:

- (a) at least two electrodes;
- (b) a polymer arranged in a manner which causes a portion of the polymer to deflect in response to a change in electric field and/or arranged in a manner which causes a change in electric field in response to deflection of the polymer, wherein the polymer has an elastic modulus at most about 100 MPa; and
- (c) a layer laminated to at least a portion of one of the polymer and the at least two electrodes.

160. Ex. H states that in Optotune's LSRs, "a diffuser is bonded on a polymer membrane ..." Ex. H at 4.

161. Optotune's LSR models have a diffuser layer laminated to a portion of an EAP membrane.

162. Defendants have directly infringed and continue to directly infringe at least claim 1 of the '106 Patent by using, offering for sale, selling and/or importing the Accused Products, including the LSR-3000 model, without authority in or into the United States, and will continue to do so unless enjoined by this Court or the patent expires, whichever is sooner. As a direct and proximate result of Defendants' direct infringement of the '106 Patent, Plaintiffs Parker-Hannifin and SRI have been and continue to be damaged.

163. Defendant Optotune has been aware of the '106 Patent since at least when it received the May 12, 2016 letter (Ex. N).

164. Defendant Optotune at least has indirectly infringed and continues to indirectly infringe at least claim 10 of the '106 Patent by actively inducing its respective customers of the Accused Products to directly infringe at least claim 1 of the '106 Patent by, among other things, providing Accused Products to users thereof with instructions on how to use the Accused Products. Defendant Optotune engaged and hence forward will continue to engage in such inducement having knowledge of the '106 Patent. Furthermore, Defendant Optotune knew or should have known that its actions would and will continue to induce direct infringement by the users of the Accused Products, and intended and will continue to intend that its actions would induce direct infringement by such users. As a direct and proximate result of Defendant Optotune's indirect infringement by inducement of the '106 Patent, Plaintiffs Parker-Hannifin and SRI have been and continue to be damaged.

165. By engaging in the conduct described herein, Defendants has injured Plaintiffs Parker-Hannifin and SRI and are liable for infringement of the '106 Patent, pursuant to 35 U.S.C. § 271.

166. Defendants have committed these acts of infringement without license or authorization.

167. Defendant Optotune has committed these acts of infringement with knowledge of the '106 Patent and thus has acted recklessly and willfully with regard to the rights of Plaintiffs Parker-Hannifin and SRI in the '106 Patent.

168. As a result of Defendants infringement of the '106 Patent, which is willful at least in the case of Optotune, Plaintiffs Parker-Hannifin and SRI have suffered monetary damages and are entitled to a monetary judgment in an amount at least adequate to compensate for Defendants' infringement.

169. Plaintiffs Parker-Hannifin and SRI will continue to suffer damages in the future unless Defendants' infringing activities are enjoined by this Court or the patent expires, whichever is sooner. As such, Plaintiffs Parker-Hannifin and SRI are entitled to compensation for any continuing and/or future infringement of the '106 Patent until the date that Defendants are finally and permanently enjoined from further infringement or the patent expires, whichever is sooner.

#### **COUNT SIX - INFRINGEMENT OF THE '110 PATENT**

170. Paragraphs 1 to 169 are incorporated herein by reference as if fully set forth herein.

171. As a representative claim of the '110 Patent, claim 1 recites a method of fabricating a transducer formed of a pre-strained polymer and one or more electrodes.

172. The elements of the method of claim 1 are:

- (a) pre-straining a first portion of a polymer to form the pre-strained polymer, wherein the polymer has an elastic modulus below 100 MPa;
- (b) fixing a second portion of the pre-strained polymer to a solid member; and
- (c) forming the one or more electrodes on the pre-strained polymer:

173. Optotune fabricates transducers for its LSR models that have a pre-strained EAP and one or more electrodes as shown and described in Exs. I, K and L.

174. As part of that fabrication process, Optotune pre-strains the EAP as described in Ex. M (the '520 Patent) at col. 5:1-9.

175. As another part of that fabrication process, Optotune fixes a portion of the pre-strained EAP to a solid member as shown at Fig. 1 of Ex. K where the solid member is depicted as a green rectangle around the EAP.

176. As another part of that fabrication process, Optotune forms one or more electrodes on the pre-strained EAP as shown and described in Exs. I, K and L.

177. Defendants have directly infringed and continue to directly infringe at least claim 1 of the '110 Patent under 35 U.S.C. § 271(g) by, without authority, importing into the United States, offering to sell, and/or selling within the United States, LSRs made according to at least claim 1 of the '110 Patent, and will continue to do so unless enjoined by this Court or the patent expires, whichever is sooner.

178. Upon information and belief, Optotune's LSRs are not materially changed by subsequent processes.

179. Upon information and belief, Optotune's LSRs do not become trivial and nonessential components of another product.

180. As a direct and proximate result of Defendants' direct infringement of the '110 Patent, Plaintiffs Parker-Hannifin and SRI have been and continue to be damaged.

181. Defendant Optotune has been aware of the '110 Patent since at least when it received the May 12, 2016 letter (Ex. N).

182. Defendant Optotune at least has indirectly infringed and continues to indirectly infringe at least claim 10 of the '110 Patent by actively inducing its respective customers of the Accused Products to directly infringe at least claim 1 of the '110 Patent by, among other things, providing Accused Products to users thereof with instructions on how to use the Accused Products. Defendant Optotune engaged and hence forward will continue to engage in such inducement having knowledge of the '110 Patent. Furthermore, Defendant Optotune knew or should have known that its actions would and will continue to induce direct infringement by the users of the Accused Products, and intended and will continue to intend that its actions would induce direct infringement by such users. As a direct and proximate result of Defendant Optotune's indirect infringement by inducement of the '110 Patent, Plaintiffs Parker-Hannifin and SRI have been and continue to be damaged.

183. By engaging in the conduct described herein, Defendants has injured Plaintiffs Parker-Hannifin and SRI and are liable for infringement of the '110 Patent, pursuant to 35 U.S.C. § 271.

184. Defendants have committed these acts of infringement without license or authorization.

185. Defendant Optotune has committed these acts of infringement with knowledge of the '110 Patent and thus has acted recklessly and willfully with regard to the rights of Plaintiffs Parker-Hannifin and SRI in the '110 Patent.

186. As a result of Defendants infringement of the '110 Patent, which is willful at least in the case of Optotune, Plaintiffs Parker-Hannifin and SRI have suffered monetary damages and are entitled to a monetary judgment in an amount at least adequate to compensate for Defendants' infringement.

187. Plaintiffs Parker-Hannifin and SRI will continue to suffer damages in the future unless Defendants' infringing activities are enjoined by this Court or the patent expires, whichever is sooner. As such, Plaintiffs Parker-Hannifin and SRI are entitled to compensation for any continuing and/or future infringement of the '110 Patent until the date that Defendants are finally and permanently enjoined from further infringement or the patent expires, whichever is sooner.

**COUNT SEVEN - INFRINGEMENT OF THE '064 PATENT**

188. Paragraphs 1 to 187 are incorporated herein by reference as if fully set forth herein.

189. As a representative claim of the '064 Patent, claim 1 recites a method of fabricating a device including an electroactive polymer and multiple electrodes.

190. The elements of the method of claim 1 are:

- (a) mechanically stretching a polymer to form a pre-strained electroactive polymer, wherein the pre-strained electroactive polymer has an elastic modulus below 100 MPa;
- (b) fixing a first portion of the pre-strained electroactive polymer to a solid member;
- (c) forming a first electrode on a portion of a first surface of the pre-strained electroactive polymer; and



- (d) forming a second electrode on a portion of a second surface of the pre-strained electroactive polymer.

191. Optotune fabricates its LSR devices as including an EAP and multiple electrodes as shown and described in Exs. I, K and L.

192. As part of that fabrication process, Optotune mechanically stretches the EAP as described in Ex. M.

193. As another part of that fabrication process, Optotune fixes a portion of the pre-strained EAP to a solid frame or member as shown at Fig. 1 of Ex. K where the solid member is depicted as a green rectangle around the EAP. See also Ex. M at col. 7:1-3.

194. As another part of that fabrication process, Optotune forms respective electrodes on opposite surfaces of the pre-strained EAP as shown and described in Exs. I, K and L.

195. Defendants have directly infringed and continue to directly infringe at least claim 1 of the '064 Patent under 35 U.S.C. § 271(g) by, without authority, importing into the United States, offering to sell, and/or selling within the United States, LSRs made according to at least claim 1 of the '064 Patent, and will continue to do so unless enjoined by this Court or the patent expires, whichever is sooner.

196. Upon information and belief, Optotune's LSRs are not materially changed by subsequent processes.

197. Upon information and belief, Optotune's LSRs do not become trivial and nonessential components of another product.

198. As a direct and proximate result of Defendants' direct infringement of the '064 Patent, Plaintiffs Parker-Hannifin and SRI have been and continue to be damaged.

199. Defendant Optotune has been aware of the '064 Patent since at least when it received the May 12, 2016 letter (Ex. N).

200. Defendant Optotune at least has indirectly infringed and continues to indirectly infringe at least claim 10 of the '064 Patent by actively inducing its respective customers of the Accused Products to directly infringe at least claim 1 of the '064 Patent by, among other things, providing Accused Products to users thereof with instructions on how to use the Accused Products. Defendant Optotune engaged and hence forward will continue to engage in such inducement having knowledge of the '064 Patent. Furthermore, Defendant Optotune knew or should have known that its actions would and will continue to induce direct infringement by the users of the Accused Products, and intended and will continue to intend that its actions would induce direct infringement by such users. As a direct and proximate result of Defendant Optotune's indirect infringement by inducement of the '064 Patent, Plaintiffs Parker-Hannifin and SRI have been and continue to be damaged.

201. By engaging in the conduct described herein, Defendants has injured Plaintiffs Parker-Hannifin and SRI and are liable for infringement of the '064 Patent, pursuant to 35 U.S.C. § 271.

202. Defendants have committed these acts of infringement without license or authorization.

203. Defendant Optotune has committed these acts of infringement with knowledge of the '064 Patent and thus has acted recklessly and willfully with regard to the rights of Plaintiffs Parker-Hannifin and SRI in the '064 Patent.

204. As a result of Defendants infringement of the '064 Patent, which is willful at least in the case of Optotune, Plaintiffs Parker-Hannifin and SRI have suffered monetary damages and

are entitled to a monetary judgment in an amount at least adequate to compensate for Defendants' infringement.

205. Plaintiffs Parker-Hannifin and SRI will continue to suffer damages in the future unless Defendants' infringing activities are enjoined by this Court or the patent expires, whichever is sooner. As such, Plaintiffs Parker-Hannifin and SRI are entitled to compensation for any continuing and/or future infringement of the '064 Patent until the date that Defendants are finally and permanently enjoined from further infringement or the patent expires, whichever is sooner.

### **PRAYER FOR RELIEF**

WHEREFORE, Plaintiffs pray for the following relief:

A. That Defendants be adjudged to have infringed the Asserted Patents, directly, indirectly, and/or by way of inducement, literally and/or under the doctrine of equivalents;

B. That Defendants, their officers, directors, agents, servants, employees, attorneys, affiliates, divisions, branches, parents, and those persons in active concert or participation with any of them, be preliminarily and permanently restrained and enjoined from directly and/or indirectly infringing the Asserted Patents;

C. An award of damages pursuant to 35 U.S.C. § 284 sufficient to compensate Plaintiffs for Defendants' past infringement and any continuing or future infringement up until the date that Defendants are finally and permanently enjoined from further infringement or the patents expire, whichever is sooner, including compensatory damages;

D. An assessment of pre-judgment and post-judgment interest and costs against Defendants, together with an award of such interest and costs, in accordance with 35 U.S.C. § 284;

E. That Defendants be directed to pay enhanced damages under 35 U.S.C. § 284 and Plaintiffs' attorneys' fees incurred in connection with this lawsuit pursuant to 35 U.S.C. § 285; and

F. That Plaintiffs have such other and further relief as this Court may deem just and proper.

**JURY DEMAND**

Plaintiffs demand a trial by jury of any and all causes of action so triable by right.

Dated: February 7, 2018

Respectfully submitted,

**K&L GATES LLP**

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*Pro hac vice applications to be filed*

*Attorneys for Plaintiffs Parker-Hannifin  
Corporation and SRI International*

**LOCAL CIVIL RULE 11.2 CERTIFICATION**

Under Local Civil Rule 11.2, the undersigned counsel for Parker-Hannifin Corporation and SRI International hereby certifies that, to the best of my knowledge, the matter in controversy is not the subject of any other action pending in any court, or of any pending arbitration or administrative proceeding. I certify under penalty of perjury that the foregoing is true and correct.

s/ Loly G. Tor

Loly G. Tor